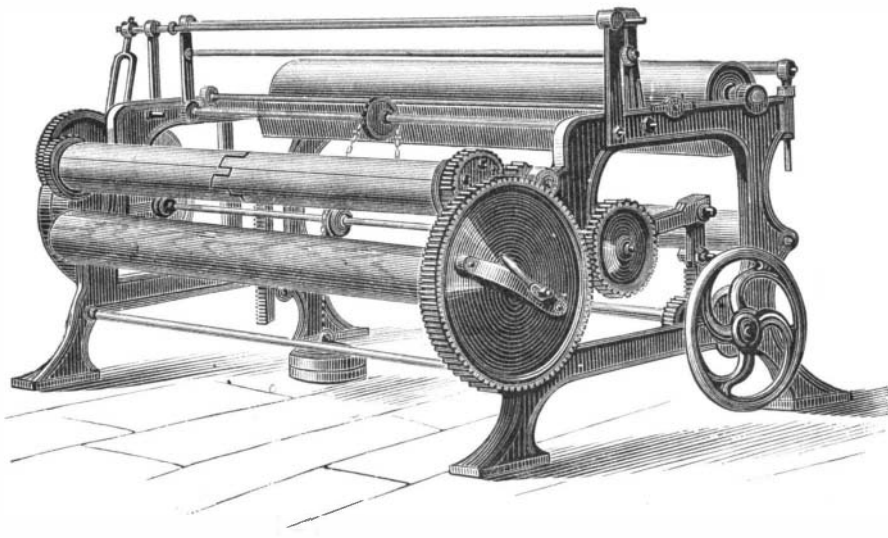


MACHINE FOR STRETCHING AND SOFTENING CLOTH.

The machine illustrated in our engraving is the invention of Mr. Devilder, and is designed for stretching and softening woollens, linens, and other fabrics. Several cylinders and rollers are supported by a cast iron frame, and operated by power transmitted by a belt and gearing. The necessary pressure on the goods is produced by a weight, pulleys, and levers. The goods, rolled on the lower cylinder in the rear part of the machine, are carried between a zinc cylinder and a wooden roller situated directly above the lower cylinder. The zinc cylinder runs in a trough filled with water. By this means the necessary degree of moisture is imparted to the goods. They are next taken up by a bar at the top of the machine, which may be regulated so as to increase or lessen the tension of the goods. From this bar the goods pass to the stretching cylinder, which is composed of sixteen copper plates revolving around, and alternately approaching to and receding from a common axis. The approach takes up the first half of the revolution and the return the second half. The goods, by this means, are well stretched; they are afterward rolled on a wooden cylinder below the stretcher. This machine has been extensively introduced throughout France.—*Revue Industrielle.*



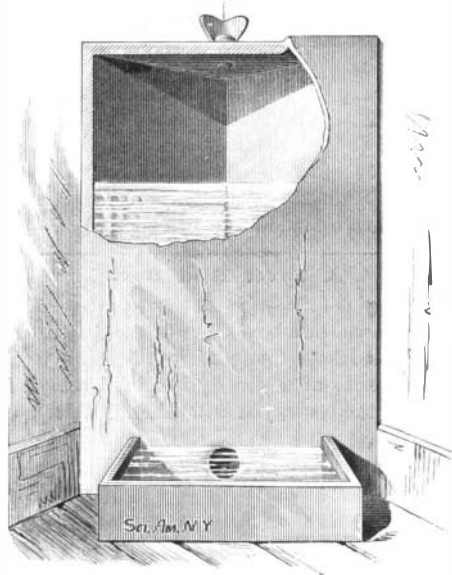
leading railroads. For further information address Mr. F. C. Mathews, 237 and 239 Canal street, New York.

FOUNTAIN WATERING TROUGH FOR CATTLE.

The watering trough shown in the annexed engraving is especially designed for use in connection with cattle transporting cars. Its principle is essentially that of the reservoir of the well known student lamp. The upright tank which

holds the water fits the corner of the car. A drinking trough is attached to the front or wider side of the reservoir, and communicates through a threaded aperture with the reservoir, which has at the top a stoppered aperture for filling.

As the cattle drink from the trough, the water becomes lower than the top of the threaded aperture and air is admitted to the reservoir, allowing water to escape until the aper-

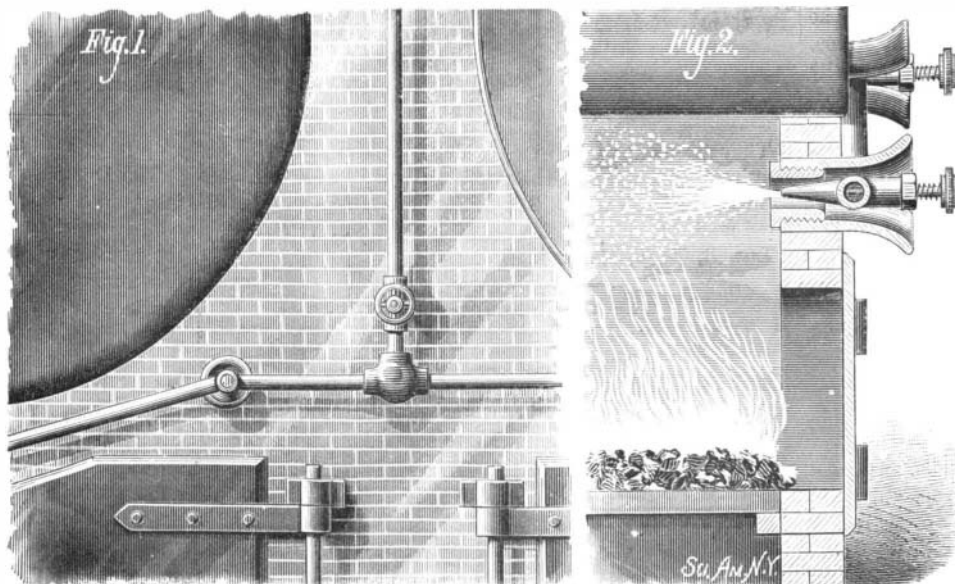


JOHNSON'S WATERING TROUGH FOR CATTLE.

ture is again covered. By this operation the trough is always kept full of fresh water until the reservoir is exhausted.

The reservoir is filled through the stoppered aperture at the top, after closing the lower aperture with a screw plug.

This apparatus takes up none of the room of a car which would be available for other purposes, and it affords a needed relief to cattle that are not too well treated at best. This watering trough is the invention of Mr. Samuel Johnson, of Philadelphia, Pa.



MATHEWS' BOILER ATTACHMENT.

A Canadian Canal Project.

A special committee of the Ontario Legislature have reported in favor of the proposed Huron and Ontario Ship Canal. They think that the hydraulic lift lock will be the principal means of overcoming the difficulties in the construction of the canal. The estimated cost is \$20,000,000. Of the utility of the canal the committee say:

"A cargo of grain shipped from Chicago through the Sault Ste. Marie Canal, Lakes Huron and Erie, and the Erie Canal by way of New York to Liverpool, would traverse a distance of 4,600 miles. The same cargo, passing through the proposed canal, and going by the St. Lawrence canals by way of Quebec, would only have to traverse a distance of 3,766 miles, a saving of no less than 834 miles. Even compared with the Welland Canal the gain in distance is very great. From Chicago to Quebec by the Welland Canal is 1,500 miles, while by the Huron and Ontario Ship Canal it would be 1,180 miles, a saving in distance of about 320 miles."

After making due allowance for tolls, the estimated saving in the cost of shipping grain from Chicago to Liverpool, by the proposed route, would be close upon \$3 a ton.

A NEW ATTACHMENT FOR BOILERS.

A great amount of attention has been bestowed upon the economical consumption of steam, and the more vital question of economy in the generation of steam has been more or less considered. While many improvements have been developed, no very remarkable results have been heretofore attained. The accompanying engraving, however, shows an attachment for boilers which promises to be important. A number of practical tests extending over a considerable time appear to demonstrate that the correct principle has been arrived at.

The invention, which is exceedingly simple, may be readily understood by reference to the engraving. A steam pipe extends along the face of the boiler arch, as shown in Fig. 1, and connects with a series of small nozzles placed concentrically in bell-shaped tubes that extend through the fire arch wall, as indicated in the sectional view, Fig. 2. These nozzles are inclined slightly downward, and the steam which enters through them tends to hold the gases down near the fire, where they are subjected to intense heat; this, in connection with the air which is drawn in through the bell-shaped tube, and the steam which is partly or wholly decomposed, produces a very high heat and insures the complete combustion of the gases. This effect is realized even where the natural draught is insufficient to maintain the required steam pressure, as it is found that wherever the apparatus is applied the draught is greatly improved. Another thing which is of secondary importance is the entire absence of deposits on the boiler or flues.

The inventor claims that this apparatus will not only save a large percentage where a good quality of coal is burned, but it will enable a poor quality of coal to be used with good results.

We have before us a report of tests made on a steamer plying on one of the Western rivers, which indicates an important saving in coal. We are also informed that it is in successful use on some of the

Have we too many Colleges?

Professor R. D. Hitchcock, a profound thinker and writer who has but few equals in any land, lately addressed the graduating classes of one of the medical colleges in this city. Passing over that portion of his address to the students in which he gave them wise counsel as to their duties on entering the field of their profession, we proceed to the Professor's closing remarks. Alluding to the three professions, medicine, law, and divinity, in which, he claims each has its own science or group of sciences to cultivate, he adds:

"The professions are to society what the brain is to the body. But the brain may be too big for the body, or may get too much of the blood. This is what is the matter with Greece to-day. A university with more than fifty professors, and more than twelve hundred students, for a people numbering only a million and a half, is something to be looked at twice, and looked at all around, before we applaud it. If these young men, when they quit the university, would also quit Athens, return to their sunburnt homes, to plant trees, sow crops, ply trades, build roads, and launch vessels, Greece might hope to be Greece again—the Greece of Pericles as well as Plato. I may be blamed for saying it, but I am honestly of the opinion that our American civilization also is overdoing itself professionally, not in quality, but in quantity. Political economy is now in rapid development, and will be able

to tell us, by-and-by, with a great deal of precision and certainty, the proper normal proportion between the four great classes which we call agricultural, mechanical, commercial, and professional. Meanwhile, I think it safe to say that we are just now making too many doctors, such as they are; too many lawyers, such as they are; too many ministers, such as they are. I do not forget that the Christian ministry claims to be, and is, preeminently a service, not wholly of this world. But it is likewise a profession, and as such, amenable to economic law. I know, too, very well, that no profession is crowded near the top. But too much crowding at the bottom hurts the top; too much competition for the lower places cheapens the competitors; so that candidates for the higher places are fewer, if not inferior. In regard to your own profession, tell me whether it is yielding to-day its proper proportion of great practitioners and authors? I may be mistaken about the other professions, though I know them better; but my impression is that the law is not yielding to-day its proper proportion of jurists and statesmen, nor is divinity yielding its proper proportion of great preachers and theologians.

"Our educational system, I feel constrained to say, is, in my judgment, seriously defective. Of academies like those at Exeter, Andover, and Easthampton, we have too few, of colleges and professional schools, we have too many. If some of them would only die, bequeathing their endowments to institutions better placed and better appointed, it would be a great gain. Under present conditions, the next best thing to be done is to inaugurate everywhere a system of rigid examinations. Such examinations may thin our ranks for a time, perhaps permanently. If only for a time, the wisdom of the policy will soon be vindicated. If permanently, it will prove that our ranks should have been thinned long ago."

Ornamenting Steel Surfaces.

Bright steel surfaces may be ornamented by painting the patterns intended to be left bright, in Brunswick black. If the ornament is to be dead upon a bright ground, the patterns must be left untouched, and the ground painted over. Aquafortis—diluted nitric acid—should then be poured

upon the exposed parts of the steel, and in a few minutes it will be seen to have eaten sufficiently into the metal. Wash off the aquafortis with water, and Brunswick black may be removed with turpentine. If the steel is made blue by exposure to heat, the blue color can be removed, where it is not required, with white vinegar or other weak acid, the parts to remain blue being protected by Brunswick black. On the parts from which the blue is removed further variety may be gained by painting additional ornaments in Brunswick black, and exposing the remainder of the ground to the action of the aquafortis. Gilding on steel was formerly performed with a spirit, but now it is best to send the work to an electro-gilder's, first painting over those parts not to be gilt with Brunswick black. The gilding may be performed at home by the following method: It is known that if sulphuric ether and nitro-muriate of